

**ABSTRACT OF THE DISCLOSURE**

An apparatus for electroless spray deposition of a metal layer on a substrate, e.g., a Co shunt or barrier layer on a Cu layer on a semiconductor wafer, includes a processing chamber to hold the substrate, the processing chamber including at least one section movable between an open position to allow the substrate to be introduced into and removed from the processing chamber and a closed position to seal the processing chamber to allow for pressurization of the processing chamber. The processing chamber has an inlet to provide pressurizing gas, an exhaust line to exhaust pressurizing gas, a pressure regulator to regulate pressure there-within, and a sprayer to spray an electroless plating solution onto the substrate. A method for electroless spray deposition includes providing the in a processing chamber, sealing the processing chamber, pressurizing the processing chamber, regulating the pressure, and spraying an electroless plating solution onto the substrate.